

FIG. 1

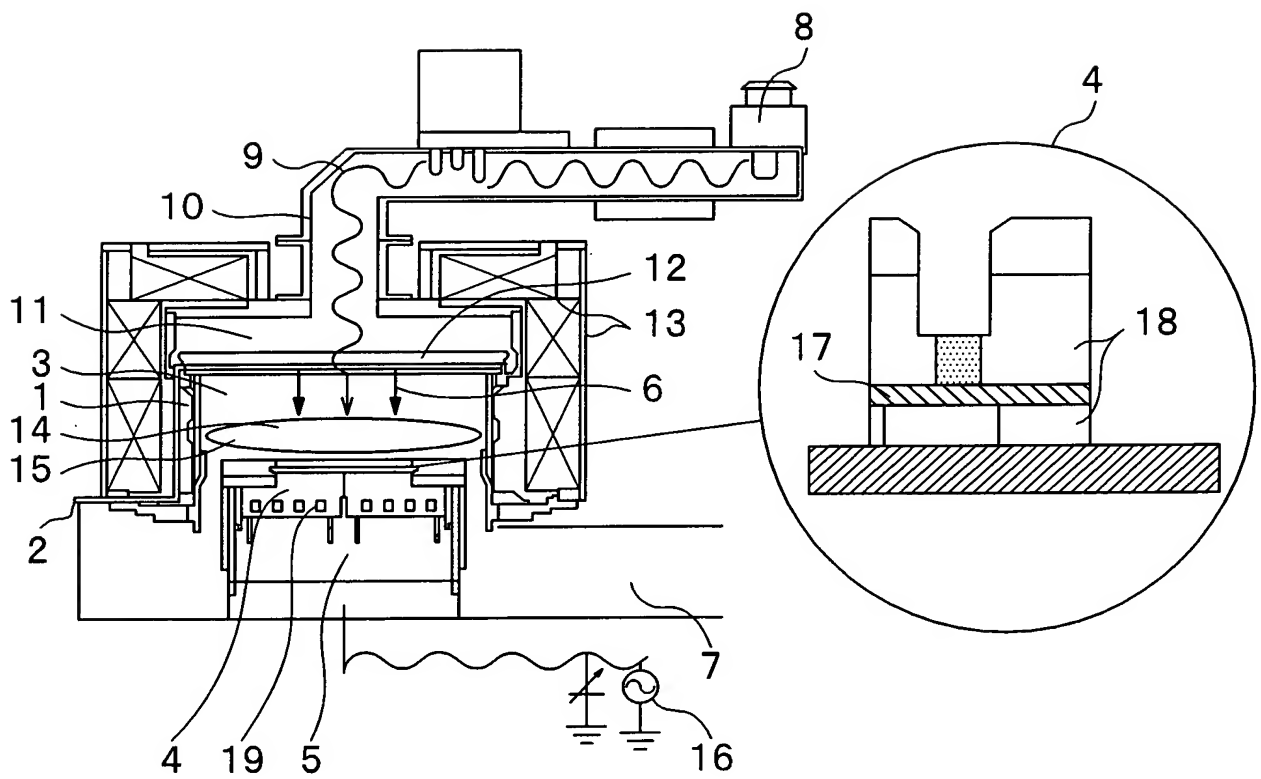
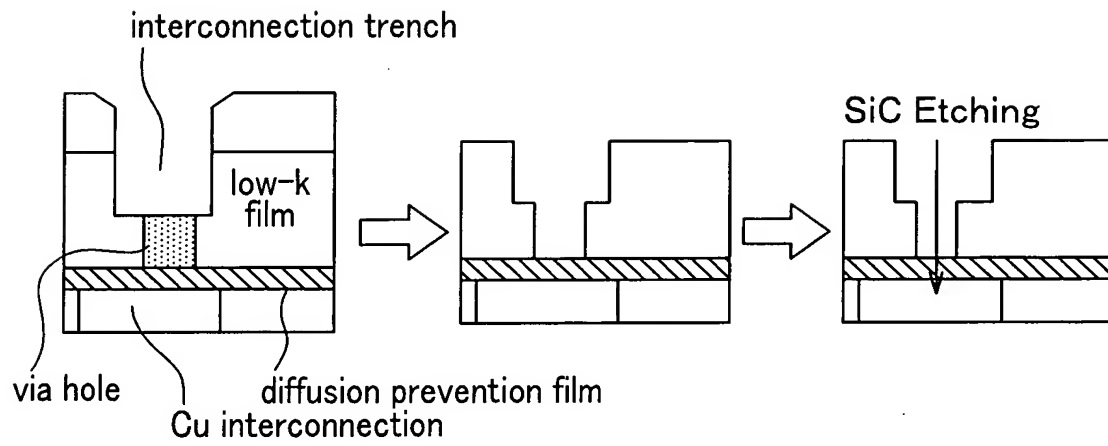
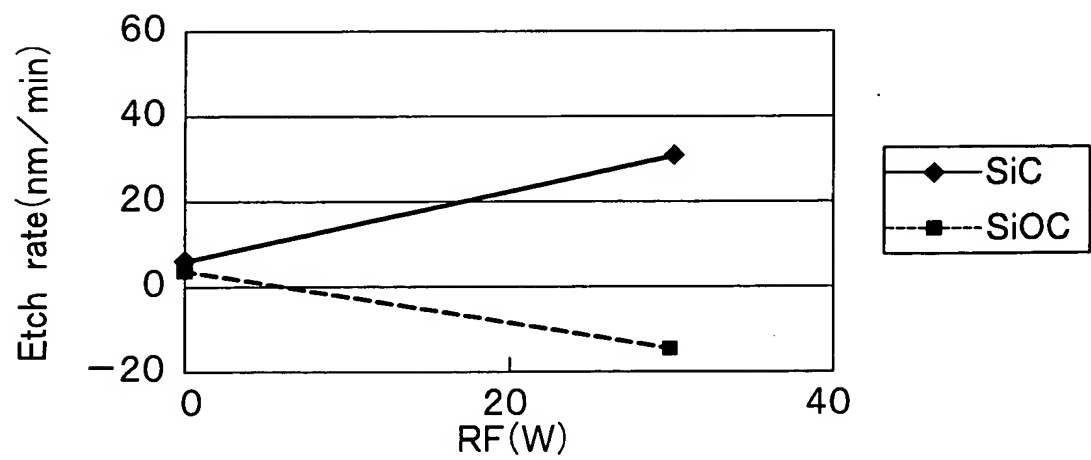
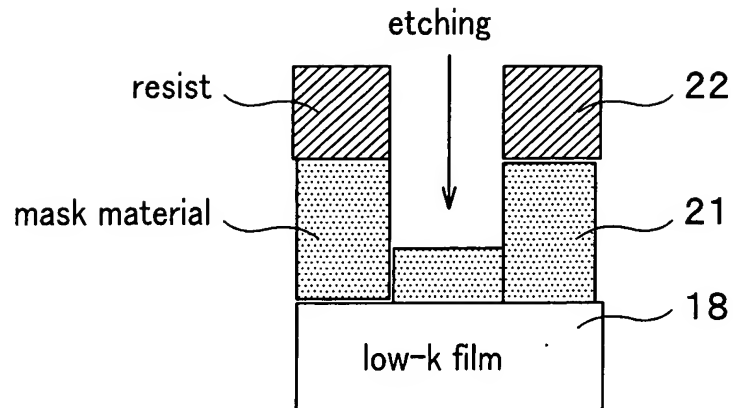


FIG.2

	protecting properties	etching properties against	perpendicularity and controlling	controlling properties for the
effect	for the low-k film	the diffusion prevention film	properties for the processed pattern	density and temperature of plasma
large	SO <sub>2</sub> , SO <sub>3</sub> , SOF <sub>2</sub>	NF <sub>3</sub> , N <sub>2</sub> F <sub>4</sub>	N <sub>2</sub> , NH <sub>3</sub> , NOx	increase the electron temperature
	SO <sub>2</sub> F <sub>2</sub> , SONx	NF <sub>3</sub> O	N <sub>2</sub> O	in the order of He, Ne, Ar, and Xe
	SH <sub>2</sub>	SF <sub>4</sub> , SF <sub>6</sub>		
	CO <sub>2</sub> , CO, O <sub>2</sub>			
	C <sub>3</sub> O <sub>2</sub>	CF <sub>4</sub>		increase the density
			HCl, HBr, HF	in the order of Xe, Ar, Ne, and He
small	SiCl <sub>4</sub> , SiBr <sub>4</sub>		HI	
		HBr	CHF <sub>3</sub> , CH <sub>2</sub> F <sub>2</sub>	
	C <sub>x</sub> F <sub>y</sub> (x/y > 1.5)			

**FIG.3****FIG.4**

**FIG.5****FIG.6**

the binding energy between the surface and the product

surface	Si-	C-	O-
product	(eV)	(eV)	(eV)
CF <sub>4</sub>	C:-0.04 F:1.01	-0.29	-0.05
CF <sub>2</sub>	2.71	3.01	3.30
CO	0.75	1.02	1.68
CO <sub>2</sub>	C:-0.15 O:0.08	0.12 -0.51	0.68 0.79
COF <sub>2</sub>	0.2	0.22	0.56
SiF <sub>4</sub>	-0.04	-0.23	0.13
SiCl <sub>4</sub>	-0.39	-0.3	1.04
CCl <sub>4</sub>	1.73	1.09	1.20
SF <sub>6</sub>	1.37	1.89	-0.39
SF <sub>4</sub>	2.74	2.74	3.10
NF <sub>3</sub>	3.52	1.46	0.95
SO <sub>2</sub>	0.95	1.16	1.96
N <sub>2</sub>	-0.01	-0.27	-2.31

**FIG. 7**

the binding energy between the  
surface (Si, C, O, N) and the product

product	Si- (eV)	C- (eV)	O- (eV)	N- (eV)
SO <sub>2</sub>	0.95	1.16	1.96	
CO <sub>2</sub>	C:-0.07	-0.33	0.69	0.54
	C:0.28	-0.78		
SiF <sub>4</sub>	-0.1	-0.03	-0.08	0.34
CF <sub>4</sub>	C:-0.04	-0.16	-0.05	-0.01
	F:1.01			
COF <sub>2</sub>	C:0.19	0.25	0.56	0.75
	O:0.92	-0.32		
CNF	C:1.49	1.93	2.34	2.12
	N:1.84	1.21		
CNCl	C:1.18	1.53	1.73	1.68
	N:1.52	0.93		
CNH	C:0.83	1.17	1.5	1.35
	N:0.94	0.46		
CO	0.81	1.07	1.68	1.75
CF <sub>2</sub>	2.71	3.1	3.29	3.26
SiF <sub>2</sub>	1.34	1.98	3.43	2.75
CCl <sub>4</sub>	C:1.73	1.09	1.23	1.13
	Cl:1.75			
SiF <sub>2</sub> Cl <sub>2</sub>	-0.08	-0.29	0.74	0.49
SiCl <sub>4</sub>	-0.39	-0.4	1.04	0.24
	Cl:0.04			
N <sub>2</sub>	-0.01	-0.27	-2.31	-0.68
NF <sub>3</sub>	3.89	1.28	0.39	0.93
SiF <sub>2</sub> Br <sub>2</sub>	-0.19	0.03	0.95	0.71
SiBr <sub>4</sub>	-0.25	0.28	1.65	0.49

FIG.8

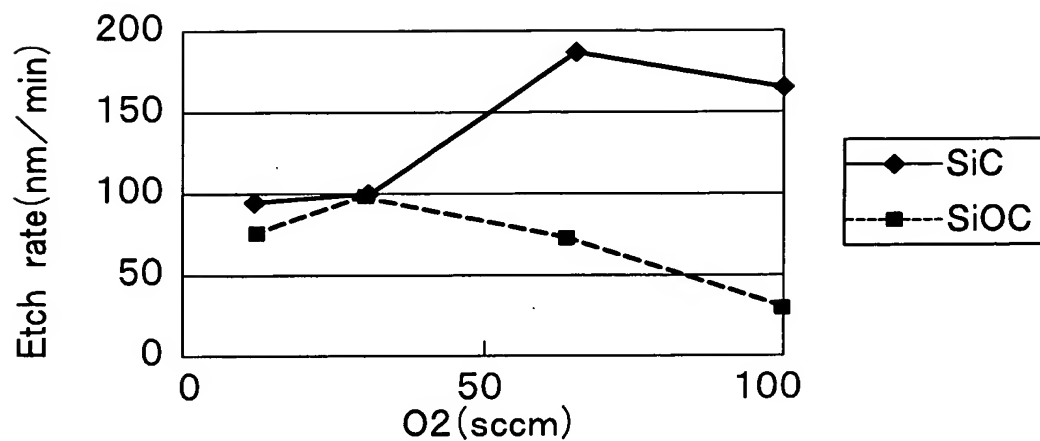


FIG.9

